RECEIVED
CENTRAL FAX CENTER
APR 01 2008

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-19. (Canceled)

20. (Currently Amended) A method for improving the measurement of a plurality of types of specific particles of a sample using a photodetector ~~associated with a biological analysis system~~ wherein each type of the plurality of types of specific particles ~~are adapted to emit identifiable signals based on the interaction of the specific particles~~ is labeled with a corresponding ~~probes and wherein the identifiable signals are captured by the photodetector to yield an output signal and wherein the photodetector is adapted to be operated at different configurations that respond differently to the identifiable signals~~ probe such that each type of the plurality of types of specific particles emits an identifiable signal that differs from the identifiable signals of the other types of the plurality of types of specific particles, the method comprising:

providing a photodetector configured in a first configuration comprising a first dynamic range having a first upper limit;

performing a first measurement of the identifiable signals with the photodetector at ~~a~~ the first configuration such that the photodetector yields a first output signal representing ~~a measurement~~ the abundance of a first type of the plurality of types of specific particles, ~~wherein the first measurement at the first configuration is adapted to measure a first component of the identifiable signals~~ and yields a second output signal representing the abundance of a second type of the plurality of types of specific particles;

PAGE 4/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

configuring the photodetector to a second configuration comprising a second dynamic range having an upper limit that is greater than the first upper limit;

performing a second measurement of the identifiable signals with the photodetector at ~~a~~ the second configuration such that the photodetector yields a ~~second~~ third output signal representing ~~a measurement~~ the abundance of ~~a second~~ the first type of the ~~plurality of types of~~ specific particles, ~~wherein the second measurement at the second configuration is adapted to measure a second component of the identifiable signals, the second component is weaker than~~ and yields a fourth output signal representing the abundance of the second type of specific particles, the first ~~component~~ output signal exceeds the first upper limit, and the particles of the first type of specific particles are more abundant in the sample than the particles of the second type of specific particles; ~~and~~

determining that the first output signal falls outside of the first dynamic range by determining that the first output signal is greater than the first upper limit; and

~~adjusting one of the first and second output signals based on a relationship between the first and second parameters to obtain a separately scaled representation of at least one of the identifiable signals wherein the representation of the identifiable signals includes generating representations of the first and second types of the plurality of types of specific particles~~ combining the first measurement and the second measurement to determine a scaled representation of the first output signal at the first configuration.

21-22. (Canceled)

PAGE 5/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

23. (Currently Amended) The method of claim 20, wherein ~~adjusting one of~~ combining the first measurement and the second ~~output signals~~ measurement comprises scaling the first output signal to a scale associated with the second configuration such that, based on the second configuration, the ~~second component~~ third output signal is measured and the first ~~component~~ output signal is represented based on the scaling of the measured value from the third output signal at the ~~first~~ second configuration.

24. (Currently Amended) The method of claim 23, wherein the scaling of the first ~~component~~ output signal allows representation of both the second and first ~~components~~ output signals when a dynamic range associated with the detector is limited and ~~would~~ is not ~~be~~ able to measure the first ~~component~~ output signal at the ~~second~~ first configuration.

25. (Currently Amended) The method of claim 24, wherein the detector is a charge-coupled device and the first configuration comprises an exposure duration T1 ~~selected to measure the first component of the identifiable signals~~.

26. (Currently Amended) The method of claim 25, wherein the second configuration comprises an exposure duration T2 ~~selected to measure the second component of the identifiable signals~~, wherein the exposure duration T2 is ~~longer~~ shorter than the exposure duration T1.

27. (Currently Amended) The method of claim 26, wherein the ~~scaling of the first output signal~~ combining comprises multiplying a valve of the ~~first~~ third output signal ~~value~~ by a ratio T2/T1 to determine the scaled representation of the first output signal at the first configuration.

PAGE 6/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

28. (Currently Amended) The method of claim 24, wherein the detector is a charge multiplier and the first configuration comprises an operating voltage V1 ~~selected to measure the first component of the identifiable signals~~.

29. (Currently Amended) The method of claim 28, wherein the second configuration comprises an operating voltage V2 ~~selected to measure the second component of the identifiable signals~~, wherein the operating voltage V2 is ~~higher~~ <u>lower</u> than the operating voltage V1.

30. (Currently Amended) The method of claim 29, wherein the ~~scaling of the first output signal~~ <u>combining to determine</u> comprises determining ~~the~~ <u>a</u> scaled value N1' of the first output signal based on ~~a~~ <u>the third output signal and the</u> relationship log(N1')=m log(V2/V1) where m represents a slope of a curve obtained by plotting the multiplier's gain versus the voltage in a log-log manner.

31. (Original) The method of claim 30, wherein the charge multiplier comprises a photomultiplier tube.

32. (Original) The method of claim 30, wherein the charge multiplier comprises a charge intensifier.

33. (Currently Amended) A method of extending the dynamic range of a photodetector that measures detectable signals from a sample undergoing a biological analysis wherein the detectable signals represent two or more components of the sample, the method comprising:

PAGE 7/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

providing a photodetector configured in a first configuration comprising a first dynamic range having a first upper limit;

~~obtaining~~ performing a first measurement of the detectable signals to obtain a first output signal and a second output signal from the photodetector operated at ~~a~~ the first configuration such that ~~allows measurement of~~ the first output signal represents a first component of the detectable signals, and the second output signal represents a second component of the detectable signals;

configuring the photodetector in a second configuration comprising a second dynamic range having an upper limit that is greater than the first upper limit;

~~obtaining a second~~ performing a second measurement of the detectable signals to obtain a third output signal and a fourth output signal from the photodetector operated at ~~a~~ the second configuration such that ~~allows measurement of a second~~ the third output signal represents the first component of the detectable signals and the fourth output signal represents the second component of the detectable signals, wherein the ~~second~~ first configuration is such that the first output signal of the first component of the detectable signals ~~would fall~~ falls outside the photodetector's dynamic range; and

scaling separately the first output signal to a scale associated with the second configuration wherein the amount of scaling depends on the first and second configurations and the third output signal, wherein the separately scaled first output signal allows the generation of a representation of the first output signal at the ~~second~~ first configuration.

34. (Previously Presented) The method of claim 33, wherein the first component of the detectable signals is stronger than the second component of the detectable signals.

PAGE 8/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

35. (Canceled)

36. (Currently Amended) The method of claim 34, wherein scaling the first output signal allows representation of both the first and the second components when the dynamic range associated with the detector is limited and would not be able to measure the first component at the ~~second~~ first configuration.

37. (Currently Amended) The method of claim 36, wherein the detector is a charge-coupled device and the first configuration comprises an exposure duration T1 ~~selected to measure the first component of the detectable signals~~.

38. (Currently Amended) The method of claim 37, wherein the second configuration comprises an exposure duration T2 selected to measure ~~a~~ the second component of the detectable signals, wherein the duration of T1 is longer than the duration of T2.

39. (Currently Amended) The method of claim 38, wherein the ~~scaling of the first output signal~~ combining comprises multiplying a value of the ~~first~~ third output signal ~~value~~ by a ratio T2/T1 to determine the scaled representation of the first output signal at the first configuration.

40. (Currently Amended) The method of claim 36, wherein the detector is a charge multiplier and the first configuration comprises an operating voltage V1 ~~selected to measure the first component of the detectable signals~~.

PAGE 9/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

41. (Currently Amended) The method of claim 40, wherein the second configuration comprises an operating voltage V2 ~~selected to measure the second component of the detectable signals~~ that is lower than the operating voltage V1.

42. (Currently Amended) The method of claim 41, wherein the scaling of the first output signal comprises determining ~~the~~ a scaled value N1' of the first output signal based on ~~a~~ the third output signal and the relationship log(N1')=m log(V2/V1) where m represents a slope of a curve obtained by plotting the multiplier's gain versus the voltage in a log-log manner.

43. (Original) The method of claim 42, wherein the charge multiplier comprises a photomultiplier tube.

44. (Original) The method of claim 42, wherein the charge multiplier comprises a charge intensifier.

45. (Currently Amended) A method for improving the measurement of a plurality of types of specific particles of a sample using a photodetector ~~associated with a biological analysis system~~ wherein each type of the plurality of types of specific particles ~~are adapted to emit identifiable signals based on the interaction of the specific particles~~ is labeled with a corresponding ~~probes and wherein the identifiable signals are captured by the photodetector to yield an output signal and wherein the photodetector is adapted to be operated at different configurations that respond differently to the identifiable signals~~ probe such that each type of the plurality of types of specific particles emits an identifiable signal that differs from the identifiable signals of the other types of

PAGE 10/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

the plurality of types of specific particles, the method comprising:

providing a photodetector configured in a first configuration comprising a first dynamic range having a first lower limit;

performing a first measurement of the identifiable signals with the photodetector at ~~a~~ the first configuration such that the photodetector yields a first output signal representing ~~a measurement~~ the abundance of a first type of the plurality of types of specific particles, ~~wherein the first measurement at the first configuration is adapted to measure a first component of the identifiable signals~~ and yields a second output signal representing the abundance of a second type of the plurality of types of specific particles;

configuring the photodetector to a second configuration comprising a second dynamic range having a lower limit that is less than the first lower limit;

performing a second measurement of the identifiable signals with the photodetector at ~~a~~ the second configuration such that the photodetector yields a ~~second~~ third output signal representing ~~a measurement~~ the abundance of ~~a second~~ the first type of the ~~plurality of types of~~ specific particles, ~~wherein the second measurement at the second configuration is adapted to measure a second component of the identifiable signals, the second component is stronger than~~ and yields a fourth output signal representing the abundance of the second type of the specific particles, the first ~~component~~ output signal is less than the first lower limit, and the particles of the second type of specific particles are more abundant in the sample than the particles of the first type of specific particles; ~~and~~

determining that the first output signal falls outside of the first dynamic range by determining that the first output signal is less than the first lower limit; and

~~adjusting one of the first and second output signals based on a relationship between the~~

PAGE 11/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

~~first and second parameters to obtain a separately-scaled representation of at least one of the identifiable signals wherein the representation of the identifiable signals includes generating representations of the first and second types of the plurality of types of specific particles~~ combining the first measurement and the second measurement to determine a scaled representation of the first output signal at the first configuration.

46. (Currently Amended) The method of claim 45, wherein ~~adjusting one of~~ combining the first measurement and the second ~~output signals~~ measurement comprises scaling the first output signal to a scale associated with the second configuration such that, based on the second configuration, the ~~second component~~ third output signal is measured and the first ~~component~~ output signal is represented based on the scaling of the measured value from the ~~first~~ third output signal at the second configuration.

47. (Currently Amended) The method of claim 46, wherein the scaling of the first ~~component~~ output signal allows representation of both the second and first ~~components~~ output signals when a dynamic range associated with the detector is limited and ~~would~~ is not ~~be~~ able to measure the first ~~component~~ output signal at the ~~second~~ first configuration.

48. (Currently Amended) The method of claim 47, wherein the detector is a charge-coupled device and the first configuration comprises an exposure duration T1 ~~selected to measure the first component of the identifiable signals~~.

PAGE 12/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

49. (Currently Amended) The method of claim 48, wherein the second configuration comprises an exposure duration T2 ~~selected to measure the second component of the identifiable signals~~, wherein the exposure duration T2 is ~~shorter~~ longer than the exposure duration T1.

50. (Currently Amended) The method of claim 49, wherein the ~~scaling of the first output signal~~ combining comprises multiplying a value of the ~~first~~ third output signal ~~value~~ by a ratio T2/T1 to determine the scaled representation of the first output signal at the first configuration.

51. (Currently Amended) The method of claim 47, wherein the detector is a charge multiplier and the first configuration comprises an operating voltage V1 ~~selected to measure the first component of the identifiable signals~~.

52. (Currently Amended) The method of claim 51, wherein the second configuration comprises an operating voltage V2 ~~selected to measure the second component of the identifiable signals~~, wherein the operating voltage V2 is ~~lower~~ higher than the operating voltage V1.

53. (Currently Amended) The method of claim 52, wherein the ~~scaling of the first output signal~~ combining to determine comprises determining ~~the~~ a scaled value N1' of the first output signal based on ~~a~~ the third output signal and the relationship log(N1')=m log(V2/V1) where m represents a slope of a curve obtained by plotting the multiplier's gain versus the voltage in a log-log manner.

PAGE 13/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10

54. (Previously Presented) The method of claim 53, wherein the charge multiplier comprises a photomultiplier tube.

55. (Previously Presented) The method of claim 53, wherein the charge multiplier comprises a charge intensifier.

PAGE 14/22 * RCVD AT 4/1/2008 3:00:54 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/4 * DNIS:2738300 * CSID:703 385 9719 * DURATION (mm-ss):06-10